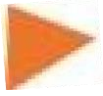




# ULTRA LOW COST HOME SECURITY GATEWAY





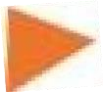
## Ultra Low Cost Home Security Gateway



The customer currently offers sensors and products in a range of sub-gig frequencies for the professional market as well as Z-Wave products for the Home Automation/DIY market. In the Home Automation/DIY market, there are several companies/users that purchase sensors from customer but are looking for hubs that can work with these sensors. The customer is looking for low cost hub where the hardware cost and the running cost should be minimum. The customer will be selling this product as a combo of IoT Gateway + a few sensors.

### Results / Outcomes

- Developed a complete system with home gateway, cloud application and mobile app.
- Brought down the overall cost of the system to few tens of dollars
- System can support millions of Hubs and users
- Simple and reliable Hub for securing homes against fire, flood and freeze
- Supports multiple wireless technologies for sensor and actuators at 433MHz and Z-wave
- Simple and easy to use mobile app for managing the hubs, receiving the notifications and control the actuators like thermostat and valves.
- Robust Backend cloud application for managing users, hubs, sensors/actuators and handling real time notification via text messages, emails and push notifications
- Followed server less Microservices architecture for future enhancements and to reduce overall cost
- Administrator web application for managing the users and hubs and complete system



# Ultra Low Cost Home Security Gateway - System Description

## System Management

- There were different hardware variants of the monitoring system with different IO cards. System management will read the hardware variant and generate a data model based on the number of IO points in the system. Watchdog checks every thread in the system and restarts it if it is not responding.

## Upgrade/Boot Management

- Upgrade Management for remote firmware upgrade including the rootfs, os and application. Primary and secondary boot partitions are supported for fail safe upgrade. Multiple boot options with priorities (primary, secondary or USB)

## Configuration Management

- Multiple configuration interfaces via WebGUI developed in Luci/Lua, SNMP, Python CLI

## Database Management

- Sqlite database is used to store configurations data. DB Framework is used for XML based configuration. POCO libraries used for sqlite handling.

## Application Management

- Event managers, Event generation/notification, Alarm Handler, Internal Faults and Statistics. POCO libraries for thread handling and notification between threads

## Protocol Management

- Protocol libraries for TL1, TBOS, TABS, Port handling, Protocol Wrapper, Client proprietary protocols

## Device Security

- System boots only if pre-calculated checksum stored in EEPROM matches with file system checksum. Security enhancement with Ip tables, restricting port access, IP filters used for restricting source IP addresses.



**THANK YOU**



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